General

Guideline Title

An official American Thoracic Society clinical practice guideline: the diagnosis of intensive care unit-acquired weakness in adults.

Bibliographic Source(s)

Fan E, Cheek F, Chlan L, Gosselink R, Hart N, Herridge MS, Hopkins RO, Hough CL, Kress JP, Latronico N, Moss M, Needham DM, Rich MM, Stevens RD, Wilson KC, Winkelman C, Zochodne DW, Ali NA, ATS Committee on ICU-acquired Weakness in Adults. An official American Thoracic Society clinical practice guideline: the diagnosis of intensive care unit-acquired weakness in adults. Am J Respir Crit Care Med. 2014 Dec 15;190(12):1437-46. [94 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Definitions for the levels of evidence (high, moderate, low, very low) and the strength of the recommendations (strong, weak) are provided at the end of the "Major Recommendations" field.

Recommendations to Aid in Decisions Regarding Diagnostic Testing for Intensive Care Unit-acquired Weakness (ICUAW)

Recommendation 1: The committee recommends well-designed, adequately powered and executed randomized controlled trials comparing physical rehabilitation or other alternative treatments with usual care in patients with ICUAW that measure and report patient-important outcomes. (strong recommendation, very low-quality evidence)

Recommendation 2: The committee recommends clinical research to determine the role of prior patient disability in the development of and recovery from ICUAW. (strong recommendation, very low-quality evidence)

Recommendation 3: The committee recommends clinical research that determines whether or not patients would want to know if they have ICUAW even though no specific therapy currently exists and how patient preferences influence medical decision making or the perception of prognosis. (strong recommendation, very low-quality evidence)

Remarks

The recommendations are strong because the guideline development committee is certain that additional research is necessary to prove whether

physical rehabilitation or other interventions improve outcomes in patients with ICUAW, and such evidence is necessary before deciding whether or not routine diagnostic testing for ICUAW is indicated.

Values and Preferences

These recommendations place a higher value on avoiding potentially burdensome diagnostic testing if it will not lead to improved outcomes and a lower value on an uncertain improvement in the rate of discharges home rather than to a rehabilitative facility.

Definitions

Levels of Evidence

The identified evidence was appraised using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. In the four level grading system (high, moderate, low, and very low quality evidence), randomized trials begin with the assumption of high quality evidence, whereas well-conducted observational studies (e.g., cohort studies, case-control studies) begin with an assumption of low quality evidence. The quality of evidence can be downgraded or upgraded on the basis of predefined criteria.

Strength of Recommendations

The decision of whether to recommend an intervention was made by consensus and based upon four criteria: the quality of evidence, the balance of desirable and undesirable consequences, patient values and preferences related to the intervention and outcomes, and resource use.

A strong recommendation was made when there was certainty about the balance of desirable and undesirable consequences of an intervention, whereas a weak recommendation was made when there was less certainty or the balance of desirable and undesirable consequences was finely balanced.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Intensive care unit-acquired weakness (ICUAW)

Guideline Category

Diagnosis

Evaluation

Risk Assessment

Clinical Specialty

Critical Care

Internal Medicine

Nursing

Physical Medicine and Rehabilitation

Intended Users

Advanced Practice Nurses

Nurses

Physical Therapists

Physician Assistants

Physicians

Respiratory Care Practitioners

Guideline Objective(s)

To develop diagnostic recommendations for intensive care unit-acquired weakness (ICUAW)

Target Population

Critically ill patients in the intensive care unit (ICU)

Interventions and Practices Considered

1. Well-designed, adequately powered and executed randomized controlled trials (comparing physical rehabilitation or other alternative treatments with usual care)
2. Clinical research to determine:
    - The role of prior patient disability in the development of and recovery from intensive care unit-acquired weakness (ICUAW)
    - Whether or not patients would want to know if they have ICUAW even though no specific therapy currently exists
    - How patient preferences influence medical decision making or the perception of prognosis

Major Outcomes Considered

- Critical beneficial outcomes (i.e., outcomes that alone are sufficient to warrant diagnostic testing)
    - Improved survival
    - Reduced recovery time (indicated by a shorter duration of mechanical ventilation, reduced length of stay in the intensive care unit [ICU] or hospital, and/or discharge home rather than to a rehabilitative or long-term medical facility)
- Less important beneficial outcomes
    - Reduced patient or family anxiety due to incorrect expectations about recovery
    - More accurate counseling about forthcoming needs for ventilation and rehabilitative services
    - Less unnecessary testing to determine the cause of delayed ventilator liberation or perceived coma
- Adverse effects and burdens of diagnostic testing, including prognostic expectations for false-positive results and both unnecessary diagnostic uncertainty and delayed initiation of therapy for false-negative results

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Systematic Review

A systematic literature review developed the bibliography for the guideline development process. A single search strategy was used, because each of the questions is related to the diagnosis of intensive care unit-acquired weakness (ICUAW). A sensitive search strategy was developed by the committee's medical librarian, which combined Medical Subject Headings and various keywords. The search strategy shown in Table E2 in the supplemental material (see the "Availability of Companion Documents" field) was initially performed in March of 2009 and then was periodically updated during the development of the guideline. Two panelists selected relevant studies using the following inclusion criteria: (1) randomized clinical trial, observational study, or case series (enrolling three or more patients); (2) exclusive enrollment of patients aged 18 years or older; and (3) explicit reporting of diagnostic testing for ICUAW. Disagreement was adjudicated through consensus of the same reviewers. The same two panelists examined the bibliographies of the selected articles and related reviews for additional studies, reviewed the studies, extracted crude data, and appraised the quality of each article.

Literature Search Strategy

The strategy was developed to be inclusive of all tests used in identifying critically-ill patients with ICUAW. It was designed as a starting point and did not preclude the use of other terms. Medline (1950-March 10, 2009), Cochrane Database of Systematic Reviews (up until March 2009), EMBASE (1980-March 2009), and EBSCO (1982-March 2009) were searched. June 2012 was the most recent search date for this document.

Summary of Evidence

The initial search, excluding duplicate reports from multiple databases based on title, identified 419 citations. Iterative review yielded 84 unique studies (see Figure E1 in the supplemental material). The committee focused their analysis on prospective studies with explicit (i.e., reproducible) diagnostic methods. Using these criteria, 31 studies were identified (see Table E4 in the supplemental material). Agreement between abstractors on study selection was near perfect, with a kappa statistic of 0.91.

Number of Source Documents

31 citations met eligibility criteria. See Figure E1 in the online supplement (see the "Availability of Companion Documents" field) for a diagram of the literature review flow-of-information.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

The identified evidence was appraised using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. In the four level grading system (high, moderate, low, and very low quality evidence), randomized trials begin with the assumption of high quality evidence, whereas well-conducted observational studies (e.g., cohort studies, case-control studies) begin with an assumption of low quality evidence. The quality of evidence can be downgraded or upgraded on the basis of predefined criteria.

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Two panelists reviewed the studies, extracted crude data, and appraised the quality of each article.

Grading of Recommendations Assessment, Development and Evaluation (GRADE) was used to describe quality of evidence and evidence tables

(see Tables E5-E9 in the online supplement [see the "Availability of Companion Documents" field]) were constructed.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Guideline Panel

These guidelines were developed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach in accordance with American Thoracic Society (ATS) policies. The Critical Care and Nursing Assemblies of the ATS sponsored the project. Invitations were sent out by the committee chair and planning committee to an initial list of experts who were asked for nominations. Twenty-two individuals accepted, representing multiple stakeholder disciplines from North America and Europe. Four individuals could not participate, and two members were excluded from voting, leaving 16 voting members (see Table E1 in the online supplement; see the "Availability of Companion Documents" field).

Formulation of Questions and Definition of Important Outcomes

The guideline development committee met to discuss the primary findings from the prior panel, review diagnostic issues in intensive-care unit acquired weakness (ICUAW), and identify important clinical questions (see below). The committee discussed what potential benefits patients could experience if an accurate diagnosis was made. The committee also identified the downsides of diagnostic testing.

Clinical Questions Used in the Deliberations of How to Make the Diagnosis of ICUAW

- In which critically ill patient groups does ICUAW occur with a significantly increased frequency?
- What tests are used to identify ICUAW and how are they applied in critically ill patients?
- How is electrophysiological testing used in critically ill patients when making the diagnosis of ICUAW?
- What is the recommended practical approach to identifying critically ill patients who develop ICUAW?

Developing Recommendations

Recommendations were considered based on the balance of beneficial versus adverse outcomes, quality of evidence, burdens, costs, and patient preferences. If it was unclear whether a particular course of action was favorable or unfavorable even after weighing these factors collectively, a recommendation was made for further research.

See Table E10 in the online supplement for voting results for iterative discussions and recommendations.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendations

The decision of whether to recommend an intervention was made by consensus and based upon four criteria: the quality of evidence, the balance of desirable and undesirable consequences, patient values and preferences related to the intervention and outcomes, and resource use.

A strong recommendation was made when there was certainty about the balance of desirable and undesirable consequences of an intervention, whereas a weak recommendation was made when there was less certainty or the balance of desirable and undesirable consequences was finely balanced.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

This official clinical practice guideline of the American Thoracic Society (ATS) was approved by the ATS Board of Directors, August 2014.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

The guideline methodology process yielded a clear understanding of current gaps in the available literature, most notably the paucity of evidence that physical rehabilitation (or any alternative therapy) improves clinical outcomes in patients diagnosed with intensive care unit-acquired weakness (ICUAW). By generating objective evidence that clinical outcomes can be improved, aggressive efforts aimed to diagnose patients with ICUAW can be justified.

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

- Testing for and treatment of intensive care unit-acquired weakness (ICUAW) is a promising management strategy for which, thus far, there is insufficient evidence of benefit to support its use. The committee members believe that further research has the potential for reducing uncertainty about the effects of this management strategy and that the results of such research will be of good value for the anticipated costs.
- Despite the lack of current evidence, there are several reasons that many members of the guideline development committee perform routine diagnostic testing to identify patients with ICUAW in their clinical practices. First, ICUAW is associated with worse clinical outcomes, and nonrecognition could lead to inappropriate expectations of recovery. Second, many believe that the potential, albeit unproven, benefits of physical therapy outweigh the downsides, because therapy can be performed without harm to the patient and with minimal burden to providers. Third, patients with ICUAW appear at risk for recurrent respiratory failure and nosocomial pneumonia possibly related to reduced neuromuscular reserve. Respiratory therapists or others could focus on respiratory support and pulmonary airway clearance in patients with ICUAW to minimize these risks. Finally, a clear phenotypic description of these patients could facilitate further research to explore causes and interventions.
- Although there are important reasons to diagnose ICUAW, there are also several limitations to the committee's approach that were discussed during their deliberations. The limitations include the committee's lack of understanding of how to interrupt the pathophysiology that leads to ICUAW, the heterogeneity of critically ill populations, and limitations inherent to the tools available. Finally, the reduced quality of life and poor functional independence of critically ill patients after critical illness needs further research to define the impact of reduced strength on this outcome.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2014 Dec 15

Guideline Developer(s)

American Thoracic Society - Medical Specialty Society

Source(s) of Funding

The Critical Care and Nursing Assemblies of the American Thoracic Society (ATS) sponsored this project.

Guideline Committee

The American Thoracic Society (ATS) Committee on Intensive-Care Unit (ICU)-Acquired Weakness in Adults

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

Author Disclosures

C.L.H. reported serving as a consultant to TransTech Pharmaceuticals ($1,000–4,999). J.P.K. reported receipt of lecture fees from Hospira ($5,000–24,999). K.C.W. reported that he is employed by the American Thoracic Society (ATS) and holds investment accounts with State Street Bank that are independently managed by Moody Lynch & Company and may have included healthcare-related holdings within general mutual funds. D.W.Z. reported serving on an advisory committee of Aegera Therapeutics and has a patent pending for regenerative therapy for peripheral nerve damage. N.A.A., F.C., L.C., E.F., R.G., N.H., M.S.H., R.O.H., N.L., M.M., D.M.N., M.M.R., R.D.S., and C.W. reported that they had no financial interests relevant to the document subject matter.

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the American Thoracic Society (ATS) Web site .

Availability of Companion Documents

The following is available:

- Fan E, Cheek F, Chlan L, Gosselink R, Hart N, Herridge MS, Hopkins RO, Hough CL, Kress JP, Latronico N, Moss M, Needham DM, Rich MM, Stevens RD, Wilson KC, Winkelman C, Zochodne DW, Ali NA, ATS Committee on ICU-acquired Weakness in Adults. An

official ATS clinical practice guideline: the diagnosis of intensive care unit acquired weakness. Online supplement. 2014 Dec 15. 18 p. Available from the American Thoracic Society (ATS) Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on April 13, 2015. The information was not verified by the guideline developer.

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